

REMARKS

This application has been reviewed in light of the Office Action dated December 13, 2005. Claims 11, 13-15, 17, 18, 23-31, 35 and 37 are presented for examination. Claims 1-10, 12, 16, 19-22, 32-34 and 36 have been cancelled, without prejudice or disclaimer of the subject matter presented therein. Claims 11, 13-15, 17, 18, 23-31, 35 and 37 have been amended. Claim 11 is in independent form. Favorable reconsideration is requested.

Claims 1-3, 7, 8, 10, 11, 15, 16, 18, 19, 22, 27, 28 and 30-33 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,066,883 (*Yoshioka et al.*). Claims 4, 6, 12-14, 17, 20, 21 and 23-26 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshioka et al.* Claims 29 and 34 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshioka et al.* in view of U.S. Patent 6,420,825 (*Shinjo et al.*), and Claims 35-37 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Shinjo et al.* in view of *Yoshioka et al.* and U.S. Patent 6,387,844 (*Fujishima et al.*).

Cancellation of claims 1-10, 12, 16-22, 32-34 and 36 renders their rejections moot.

A notable feature of the present invention is that the first insulating material film 6 containing metallic oxide particles and vacancies is provided directly on the substrate 1, and the second insulating material film 7 is provided directly on the first insulating material. Specifically, a two layer insulating film stack is part of the electron

source of the present invention by acting, among other things, to prevent sodium diffusion from the substrate into the electron emitting area. In addition, both insulating films are located beneath both electrodes.

Another notable feature of the present invention is that an electron emitting portion is composed of a combination of an electroconductive film 4 that has an electron emitting portion which rests on the second insulating material film 7, and a carbon film formed on the electroconductive film 4.¹

Independent claim 11, as amended, recites an electron source. The electron source includes a substrate, a first insulating material film provided directly on the substrate, wherein the film includes metallic oxide particles and has vacancies, and wherein a ratio of vacancy in its cross-section is within a range of 5-10%. A second insulating material film is provided directly on the first insulating material film, a pair of electrodes is provided on the second insulating material film, a pair of electroconductive films is provided between the pair of electrodes and is connected to them. A carbon film is provided on at least one electroconductive film of the pair of electroconductive films.

In the present Office Action, Yoshioka et al. is cited for allegedly disclosing that "an electron source forming substrate [4] comprising an insulating material film [5] has a surface on which an electron-emitting device [electrodes 1 and 2] of the electronic source is to be disposed, wherein said insulating material film contains a plurality of

1/It should be noted that the embodiment referred to herein is for illustration purposes only, and the claims should not be construed as being limited only thereto.

metallic oxide particles [13] and vacancy [pores or voids in the substrate, wherein the substrate is made of a mixture as recited in column 4, lines 30-36, or an unoccupied atomic site can all be considered a vacancy and the insulating layer will inherently have one] are provided among said plurality of metallic oxide particles.”

The teachings of Yoshioka et al. were described in an earlier-filed Amendment. Therefore, only patentable differences between the presently claimed invention and *Yoshioka et al.* will be described below.

First, in contrast to the electron source of Claim 1, which has two insulating material films between the substrate and electrodes, *Yoshioka et al.* is understood to teach using either no insulating layer or only a single insulating layer (Figs. 1 and Fig. 8, respectively) between the substrate and electrodes.

Second, *Yoshioka et al.* involves the following methods or structures: (i) coating a surface including an electron emitting area with fine particles (Fig. 11) of a conductive material and then heat treating to cause the fine particles to penetrate the insulating material below in the electron emitting area, (ii) coating the surface with an insulating layer which includes conductive fine particles (Figs. 12 and 13) and in some cases treating with aqueous hydro fluoric acid to cause the fine particles to protrude (Figs. 15 and 16), (iii) first coating the surface including the electron emitting area with fine particles and then coating the surface with an insulating layer and heat treating (Fig. 14), or (iv) some combination of the elements of the above methods or structures (see, e.g., Fig. 30).

However, nothing in *Yoshioka et al.* would teach or suggest an electron source comprising first and second insulating material films provided between a substrate and electrodes, electroconductive films provided between and connected to the electrodes, and a carbon film provided on at least one electroconductive film, wherein the first insulating material film has plural vacancies between metallic oxide particles and has a ratio of vacancy in its cross-section within a range of 5 - 10%, as set forth in Claim 11.

Accordingly, for all of the foregoing reasons, Claim 11 is believed to be clearly patentable over *Yoshioka et al.*

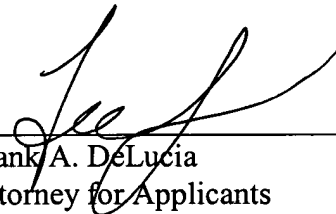
A review of *Shinjo et al.*, *Fujishima et al.* and the other art of record has not revealed anything which, in Applicants' opinion, would teach or suggest anything that would remedy the above-noted deficiencies of *Yoshioka et al.* against Claim 11 herein. Accordingly, Claim 11 is believed patentable over the art of record.

The other claims in this application are dependent from independent Claim 11 discussed above and are therefore also believed patentable for at least the same reasons as is Claim 11. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of each dependent claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and the allowance of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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